

# CAPE Forum 2019 : PROGRAMME

## Sunday, November 24, 2019

16h30 **Welcome reception at “Brasserie C” – Impasse des Ursulines, 4000 Liège**  
Access from rue Hors-Château, next to Montagne de Bueren

## Monday, November 25, 2019

8h30 – 9h00 **Participants registration**  
Salle des Professeurs of University of Liège, Place du 20 Août 7, 4000 Liège

9h00 – 9h10 **Conference opening by Grégoire Léonard & Filip Logist**  
**Welcoming address by Pierre Wolper, Rector of ULiège**

9h10 – 9h45 **Plenary lecture 1 – Chair: Filip Logist**  
« *Current developments and potential of digitalization in chemical engineering: from machine learning to the digital twin and the internet of things* » by Sergio Lucia (TU Berlin, Germany)

9h45 – 10h40 **Session 1: Data mining – Chair : Dimitri Liquet**

- Implementation of an automated site wide production accounting system at Yara Tertre  
*H. Closon, B. Vrielynck, A. Flamme. WideTech/Yara*
- Design of data-based inferential sensors for industrial depropanizer column  
*M. Mojto, K. Lubušký, M. Fikar, R. Paulen. STU Bratislava/Slovnaft*
- Modelling a spray drying unit in the production of API -Combining first principle and data driven modelling  
*C. A. Muñoz López, S. Bhonsale, J.F.M. Van Impe. KU Leuven*

10h40 – 11h00 **Coffee break**

11h00 – 11h55 **Session 2: Process control 1 – Chair : Alain Vande Wouwer**

- Feature-oriented methods for batch data analytics  
*R. Rendall, I. Castillo, L. H. Chiang, M. Reis. Dow/University of Coimbra*
- Prediction of sustainability related properties: data mining methods with incorporated prior knowledge  
*G. Shavaliyeva, S. Papadokonstantakis. Chalmers University of Technology*
- Operating costs under uncertain conditions: a flexibility based design  
*A. Di Pretoro, L. Montastruc, X. Joulia, F. Manenti. Politecnico di Milano/LGC Toulouse*

- 11h55 – 12h30 **Plenary lecture 2 – Chair: Sergio Lucia**  
 « *The P15 Insight Project at Prayon: production data analysis for an optimized process control* » by Dimitri Liquet (Prayon – SPIAPS, Belgium)
- 12h30 – 13h45 **Lunch**
- 13h45 – 14h20 **Plenary lecture 3 – Chair: Angélique Léonard**  
 « *What to do with CO<sub>2</sub>? A systems perspective on carbon dioxide utilization* » by André Bardow (RWTH Aachen, Germany)
- 14h20 – 15h45 **Session 3: New feedstocks – Chair: André Bardow**
- Sulfur-promoted syngas production in flue gas systems: The AG2STM technology  
A. Dell'Angelo, F. Manenti. Politecnico di Milano
  - Bio-Economy: Chances, challenges, and perspective of the system as a whole  
A. Pfennig. ULiège
  - Dynamic optimization of carbon capture and upgrading stages in a renewable jet fuel production facility  
M. Mostafa, E. Zondervan. University of Bremen
  - Development of solid-liquid-liquid speciation, equilibrium and data fitting tool and its application to phosphorus recovery process from sewage sludge  
Z. Shariff, A. Pfennig, A. Léonard, L. Fraikin. ULiège
- 15h45 – 16h05 **Coffee break**
- 16h05 – 17h20 **Session 4: Thermodynamic modelling & control – Chair: Andreas Pfennig**
- Model reduction for biochemical reaction systems with bi-stability  
C. E. Robles-Rodríguez, E. Steur. TU Delft
  - Order reduction for EDMD based on observable error: Application to the anaerobic digestion model  
C. Garcia-Tenorio, A. Vande Wouwer, E. Mojica. Universidad Nacional Bogota/UMons
  - Modelling water-in-oil emulsions using Aspen HYSYS against experimental data  
A. M. Sousa, M. Pereira, H. Matos. IST Lisboa
  - Implementation of VLE with Bender Equation of State  
F. Bisotti, L. Galatioto, F. Masserdotti, A. Bigi, P. Gritti, F. Manenti. Politecnico di Milano/SIAD
- 19h00 **Conference dinner - As Ouhes, Place du Marché 21, 4000 Liège**

## Tuesday, November 26, 2019

- 8h45 – 9h20      **Plenary lecture 4 – Chair: Jan Van Impe**  
 « *Data analytics for human health: improving vaccine production at GSK* » by Geert Gins (GlaxoSmithKline, Belgium)
- 9h20 – 10h15      **Session 5: Process control 2 – Chair: Laurent Dewasme**
- On the influence of discrete element model parameters using global sensitivity analysis  
S. Bhonsale, C.A. Muñoz López, J.F.M. Van Impe. KU Leuven
  - State and output sensitivity analysis of linear physics-based models  
C. S. Mendez Blanco, L. Özkan. TU Eindhoven
  - Novel aspects of differential flatness in computer aided process engineering: A biopharmaceutical manufacturing perspective  
M. Schulze, R. Schenkendorf. TU Braunschweig
- 10h15 – 10h35      **Coffee break**
- 10h35 – 11h50      **Session 6 : Process modelling 1 – Chair: Geert Gins**
- Backstepping observer design for a tubular catalytic cracking reactor  
I. Yupanqui, D. Coutinho, A. Vande Wouwer. UFSC/UMons
  - Development and application of simulation-based methods for engineering optimization under uncertainty  
A. F. Magnusson, R. Al, G. Sin. DTU
  - Olefin re-adsorption kinetics in Fischer-Tropsch synthesis: Infinite series solution of product distribution model  
A. F. Amaral, F. Manenti. Politecnico di Milano
  - Multi-objective optimisation without coding: Introducing a graphical user-interface (GUI) for INPROP  
V. De Buck, C.A. Muñoz López, J. Braeckman, S. Bhonsale, J.F.M. Van Impe. KU Leuven
- 11h50 – 12h25      **Plenary lecture 5 – Chair: Filip Logist**  
 « *Modelling, control & optimization in (bio) chemical engineering: from theory to practice* » by Jan Van Impe (KU Leuven, Belgium)
- 12h25 – 13h30      **Lunch**
- 13h30 – 14h05      **Plenary lecture 6 – Chair: Grégoire Léonard**  
 « *Making a country carbon neutral : the use of CAPE tools for energy system design* » by François Maréchal (EPFL, Switzerland)

- 14h05 – 15h25 **Session 7: Sustainability – Chair: François Maréchal**
- Evaluation of the benefits of circular economy – Life Cycle Assessment of Derbigum recycling unit  
*S. Gros Lambert, M. Getlichermann, A. Léonard. ULiège/Derbigum*
  - Water footprint and regionalization: the case study of Walloon corn  
*S. Gerbinet, F. Van Stappen, A. Léonard. ULiège/CRA-W*
  - Development of a framework integrating TEA and LCA : advances and challenges  
*A. Merlo, A. Léonard, G. Léonard. ULiège*
  - Conceptual process design: Production of hydrotreated vegetable oil as an additive for petro-diesel  
*J. T. Lüthje, R. Kiefel. RWTH – 2<sup>nd</sup> prize Winners of the Eurecha Student Contest Problem*

**Eurecha 2<sup>nd</sup> prize award ceremony**

15h25 – 15h45 **Coffee break**

- 15h45 – 17h00 **Session 8: Process modelling 2 - Chair: Georges Heyen**
- Modelling of an ammonia adsorption process for air purification boxes  
*C. Cardenas, S. Marsteau, L. Sigot, C. Vallières, A. Latifi. Université de Lorraine/INRS*
  - Simultaneous dynamic mixed-integer scheduling of production process and energy utility system  
*F. J. Baader, A. Bardow, M. Dahmen. FZ Jülich/RWTH*
  - Modeling and simulation of low pressure carburizing of steel  
*F. Matamoros Marin, P. A. Glaude, R. Bounaceur, H. Monnier, A. Latifi. Université de Lorraine/INRS*
  - Coalescence modelling for settler design  
*D. Leleu, A. Pfennig. ULiège*

17h00 **Conference conclusions and closure of the event**